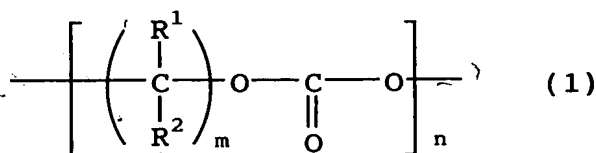


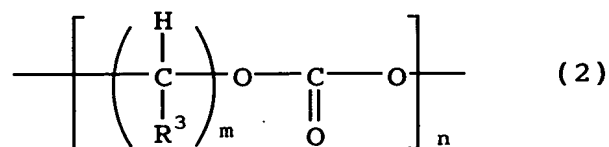
WHAT IS CLAIMED IS:

1. A solid polymer electrolyte comprising a polymer compound having a branched carbonate structure represented by formula (1) as a partial structure and at least one electrolyte salt:



wherein each R<sup>1</sup> and R<sup>2</sup> independently represents a hydrogen atom, a linear, branched or cyclic alkyl group having from 1 to 10 carbon atoms, a linear, branched or cyclic alkoxy group having from 1 to 10 carbon atoms or a linear, branched or cyclic alkoxyalkyl group having from 1 to 10 carbon atoms, m represents an integer of 3 to 10, n represents an integer of 1 to 500, and each R<sup>1</sup> and R<sup>2</sup> and each value of m and n can be the same or different, provided that R<sup>1</sup> or R<sup>2</sup> present in plurality within the same molecule are not a hydrogen atom at the same time.

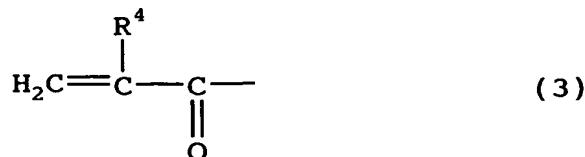
2. A solid polymer electrolyte comprising a polymer compound having a branched carbonate structure represented by formula (2) as a partial structure and at least one electrolyte salt:



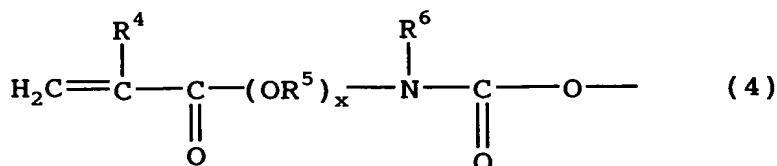
wherein R<sup>3</sup> represents a hydrogen atom, a linear, branched or cyclic alkyl group having from 1 to 10 carbon atoms, a linear, branched or cyclic alkoxy group having from 1 to 10 carbon atoms or a linear, branched or cyclic alkoxyalkyl group having from 1 to 10 carbon atoms, m represents an integer of 3 to 10, n represents an integer of 1 to 500, and each R<sup>3</sup> and each value of m and n can be the same or different, provided that R<sup>3</sup> present in plurality within the same molecule are not a hydrogen atom at the same time.

3. A solid polymer electrolyte which is a polymer of a polymerizable compound having a branched carbonate structure described in claim 1 or 2 and a polymerizable functional group represented by the following formula (3) and/or

(4):



5



wherein R<sup>4</sup> represents a hydrogen atom or a linear, branched or cyclic alkyl group having from 1 to 10 carbon atoms, R<sup>6</sup> represents a hydrogen atom, a linear, branched or cyclic alkyl group having from 1 to 10 carbon atoms, a linear, branched or cyclic alkoxy group having from 1 to 10 carbon atoms or a linear, branched or cyclic alkoxyalkyl group having from 1 to 10 carbon atoms, R<sup>5</sup> represents a divalent group which can contain a heteroatom and can have a linear, branched or cyclic structure, and x represents 0 or 1, provided that R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup> or x present in plurality within the same molecule can be the same or different.

4. The solid polymer electrolyte as claimed in claim 3, wherein the polymerizable compound has a mass average molecular weight of about 100 to about 3,000.

5. The solid polymer electrolyte as claimed in claim 3, wherein the polymerizable compound is almost liquid at room temperature and a viscosity thereof is about 5,000 mPa·S (25°C) or less.

6. The solid polymer electrolyte as claimed in claim 1 or 2, which further comprises at least one organic solvent.

7. A polymerizable composition for a solid polymer electrolyte, comprising at least one polymerizable compound claimed in claim 3, and at least one electrolyte salt.

8. The polymerizable composition for a solid polymer electrolyte as claimed in claim 7, further comprising at least one organic solvent.

9. The polymerizable composition for a solid polymer electrolyte as claimed in claim 8, wherein a viscosity is about 6.0 mPa · S (25°C) or less.

10. A solid polymer electrolyte obtained by polymerizing the polymerizable composition claimed in claim 7.

11. A solid polymer electrolyte obtained by polymerizing the polymerizable composition claimed in claim 8.

12. A solid polymer electrolyte obtained by polymerizing the polymerizable composition claimed in claim 9.

13. The solid polymer electrolyte as claimed in claim 1 or 2, wherein the electrolyte salt is at least one selected from the group consisting of an alkali metal salt, a quaternary ammonium salt and a quaternary phosphonium salt.

14. The polymerizable composition for a solid polymer electrolyte as claimed in claim 7, wherein the electrolyte salt is at least one selected from the group consisting of an alkali metal salt, a quaternary ammonium salt and a quaternary phosphonium salt.

15. The solid polymer electrolyte as claimed in claim 6, wherein the organic solvent is at least one selected from the group consisting of carbonates, aliphatic esters, ethers, lactones, sulfoxides and amides.

16. The polymerizable composition for solid polymer electrolytes as claimed in claim 8, wherein the organic solvent is at least one selected from the group consisting of carbonates, aliphatic esters, ethers, lactones, sulfoxides and amides.

17. A battery comprising a solid polymer electrolyte as claimed in claim 1, a positive electrode and a negative electrode.

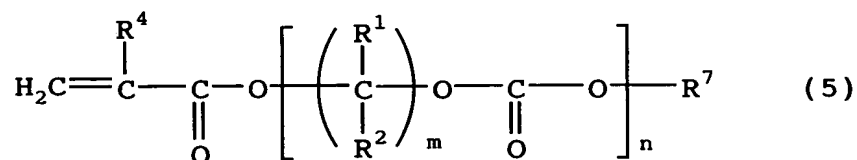
18. The battery as claimed in claim 17, which is a lithium primary or lithium secondary battery comprising at least one electrolyte salt selected from

the group consisting of  $\text{LiPF}_6$ ,  $\text{LiBF}_4$ ,  $\text{LiAsF}_6$  and  $\text{LiN}(\text{A-SO}_2)_2$ , wherein A represents a perfluoroalkyl group having from 1 to 10 carbon atoms.

19. An electric double-layer capacitor comprising a solid polymer electrolyte as claimed in claim 1 or 2, and a pair of polarizable electrodes.

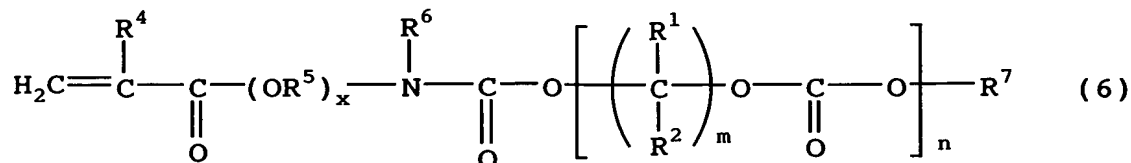
20. An electrochromic device comprising a solid polymer electrolyte as claimed in claim 1 or 2, and an electrochromic layer.

21. A polymerizable compound represented by formula (5):



wherein each  $\text{R}^1$  and  $\text{R}^2$  independently represents a hydrogen atom, a linear, branched or cyclic alkyl group having from 1 to 10 carbon atoms, a linear, branched or cyclic alkoxy group having from 1 to 10 carbon atoms or a linear, branched or cyclic alkoxyalkyl group having from 1 to 10 carbon atoms, m represents an integer of 3 to 10, n represents an integer of 1 to 500,  $\text{R}^4$  represents hydrogen or a linear, branched or cyclic alkyl group having from 1 to 10 carbon atoms,  $\text{R}^7$  represents a chained, branched and/or cyclic organic group having from 1 to 30 carbon atoms, which can contain a heteroatom and/or an unsaturated bond, and each  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^4$ , and  $\text{R}^7$  and each value of m and n, provided that  $\text{R}^1$  or  $\text{R}^2$  present in plurality within the same molecule are not a hydrogen atom at the same time.

22. A polymerizable compound represented by formula (6):



wherein each  $\text{R}^1$  and  $\text{R}^2$  independently represents a hydrogen atom, a linear, branched or cyclic alkyl group having from 1 to 10 carbon atoms, a linear, branched or cyclic alkoxy group having from 1 to 10 carbon atoms or a linear, branched or cyclic alkoxyalkyl group having from 1 to 10 carbon atoms, m

represents an integer of 3 to 10, n represents an integer of 1 to 500, x represents 0 or 1, R<sup>4</sup> represents a hydrogen atom or a linear, branched or cyclic alkyl group having from 1 to 10 carbon atoms, R<sup>7</sup> represents a chained, branched and/or  
 10 cyclic organic group having from 1 to 30 carbon atoms, which can contain a heteroatom and/or an unsaturated bond, R<sup>6</sup> represents a hydrogen atom, a linear, branched or cyclic alkyl group having from 1 to 10 carbon atoms, a linear, branched or cyclic alkoxy group having from 1 to 10 carbon atoms or a linear, branched or cyclic alkoxyalkyl group having from 1 to 10 carbon atoms, R<sup>7</sup>  
 15 represents a chained, branched and/or cyclic organic group having from 1 to 30 carbon atoms, which may contain a heteroatom and/or an unsaturated bond, and each R<sup>1</sup>, R<sup>2</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, and R<sup>7</sup> and each value of m and n can be the same or different, provided that R<sup>1</sup> or R<sup>2</sup> present in plurality within the same molecule are not a hydrogen atom at the same time.